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THE MAIN FEATURES OF THE ADVANCE IN THE STUDY OF DANISH ARCHEOLOGY¹

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Up to less than sixty years ago very little was known regarding prehistoric man. By "archeology" was meant, at that time, the study of Roman, Greek, Egyptian, and Phenician civilization. Beyond this the sober man of science hesitated to venture. That vast space of time in the history of man's development antedating written records, before any inscribed records whatsoever, was a playground for the imagination—the imagination that created the fairy tales and the myths. Here gods and demigods, giants and monsters, dwarfs and ogres, were allowed full play. Here were space and time for all that could not bear the strong light of the present or of the historic past. Here was placed that golden age to which man will steadfastly cling. Though he dare not hope for a future, here on earth, when the lion shall lie down with the lamb, yet he insists upon the darkness of prehistoric ages being illumined by rays of light from Paradise. And the poet seized this tempting material with a poet's cunning and a poet's license. He changed and added until childish myths and dark fables glittered with wisdom and beauty. He deepened that which was already deep, and adorned with a rich, profound, and mystic symbolism all that appealed to the imagination, all that was already veiled in parables, simple though not always easy to understand: a symbolism

¹ Translated by Miss Elsie Warburg, and published originally in the *Saga-Book of the Viking Club*, this interesting memoir has been revised and is now made accessible to American students.

which gave to men's minds what they will ever desire — questions to answer and riddles to solve.

But the real riddle of the past was not solved, its difficult question was not answered ; no one even tried in real earnest to do so. Learned men could not even view the childhood of the race dispassionately. They were too deeply entangled in the web wrought by priests and wise men through centuries of folklore and of ever-changing religions. True, the man of science knew that much of what was said and believed of the past was idealizing inventions ; true, every now and then a gleam of light shone forth, but, on the whole, what met him when he turned to the veiled darkness of the past was not encouraging. Nowhere was there a distinct boundary between light and darkness ; nowhere was there a separation of land and sea ; nowhere could he trace a division of time or advance in development. All was chaos.

But, slowly and steadily, albeit quietly, a serious work had begun in this direction. One fine day the first light cast its flickering beam on the fogs and mists of the dark ages. From Denmark and Sweden its light shone forth to far-off lands, where answering beams arose, all having their origin in the little flame kindled in Thomsen's poverty-stricken museum in Copenhagen, and from Sven Nilsson's study in Lund.

What these men did was, to all appearance, not much — only the trisection of Northern prehistoric times into the simple divisions of the Stone, the Bronze, and the Iron Ages. But this was just what was needed, just as certainly as that the first thing that must be done to a large and chaotic collection of facts, whether historic or prehistoric, is to try to introduce some sort of order among them, founded on the chronological sequence of events.

It is certain that many before Thomsen and Nilsson had seen that man's development had passed from a Stone age to a Metal age ; that there had been a time when the craft of metalwork was unknown, and that this time preceded the age in which metals were made into ornaments, weapons, and tools. But no one had endeavored to obtain universal acknowledgment of this truth, for no one had made a serious attempt to prove it by introducing order into the tales and by investigating the large collection of mytho-

logical fables. And no one had realized how important such a chronological division must be; even Thomsen and Nilsson can hardly have realized it in its entirety. What it means is simply this: The growth of mankind has been continuous. It has passed from dark to light; from brutality to gentler ways; from lower to higher stages in everything—in spiritual development, in morality, in religion. And the means to further this growth has been this, and this only: the energetic and untiring endeavor of mankind itself to obtain mastery over Nature, to learn her laws and to practise their use; to become master of all substances, to manipulate and use them in ever-increasing ways for the furtherance of man's innumerable aims. The object of the study of prehistoric ages must, therefore, be to grasp the tendency of all these efforts, so that we shall one day see the path along which the children of men have wandered clearly illumined before us in all its length and in all its windings.

The first step toward this goal was the trisection of the Northern prehistoric ages. For Thomsen and Nilsson did not only divide them into Stone and Metal ages, but they divided the Metal age at once into the Bronze and the Iron ages. Their hypotheses aroused great opposition, as all new ideas do: opposition not only from those who oppose every effort of science to shed light on darkness, but also from men of science. The point around which opposition after a time gathered was the division of the Metal age; all were very soon convinced that a Stone age had preceded that of Metal, not only in Scandinavia, but throughout the earth. But this served only to make the discussion as to whether a Bronze age had preceded the Iron age more bitter, especially as many tried to assert the same universality of this change as of that from the Stone age to the Metal age.

It was from Germany that the attacks on the Bronze age came. With wonderful persistency German men of science maintained that the use of iron *must* have been known before that of bronze; that the elementary metal *must* be older than the alloy, and that, therefore, the Bronze age was, and must be, a chimera. This discussion had great influence on the development of Northern archeology. For decades it forced its promoters to devote most of their work to

the support of the triple division ; it forced them again and again to rake up the question for renewed discussion, and always to seek new facts by the help of which they might successfully refute the continued attacks of the opposition. In this way a thoroughness was introduced into the work which has been extremely important. In Scandinavian archeology half-finished work, imaginings, and hasty conclusions are unknown. If such peep forth, they are promptly and completely suppressed. Tradition which, especially in Denmark, has descended from Thomsen through Worsaae to Sophus Müller has hitherto been strong enough to guard the banner.

In the seventies the strife at length subsided. The outcome was absolute defeat for the opponents of the Bronze age. The argument which was longest clung to in Germany by a number of men of science was that those decorations on the Northern bronze articles which were not produced by molding must have been made with tools of iron, perhaps even of steel, for nothing else would make the least impression on the hard bronze. Therefore iron, and even steel, must have been known in the so-called Bronze age, which, consequently, was in reality also an Iron age. To this the Danes for many years could make no reply other than that these decorations were not, and could not have been, produced with steel tools, as everything clearly pointed to the fact that these latter were unknown in the Bronze age. A goldsmith from Copenhagen — one Boas — solved the question. He was much interested in prehistoric metalwork, and often visited the Museum, where he was one day asked by Sophus Müller (now director of the Museum) for his opinion as to the decorations on the bronze articles. At first he said he could not imagine that they had been made by anything but steel-edged tools ; but on reaching home he decided to make experiments to test this question. The result was that the next day he showed a piece of bronze of the same composition as that of the Bronze age (90 % copper and 10 % tin), which he himself had decorated in the same style as the objects in the Museum with an instrument made of bronze — a small, hardened graving-tool. This ended the matter, and I mention it only because it is characteristic of the way in which Danish archeology works. The help which science has received from laymen in this direction is priceless.

Now, it is universally acknowledged that the development, at least in Europe and doubtless in the greater part of Asia, was in the following order : Stone, Copper, Bronze, Iron. For it has been proved that, in those places where it is most likely that the smelting of metals originated, a Copper age preceded the Bronze age, though this was probably of short duration, and there are very few traces of it in Scandinavia, where the craft of working in metal, and even the extraction of metals, was originally imported from other lands. The semi-civilized races of Central America seem to have been, even at the time of the arrival of Europeans on their shores, in a state of transition from the Stone to the Copper and Bronze ages. Nowhere have we found as yet any evidence that iron was known and used before copper. There are, of course, many races, including all the Negro races of Africa, which have passed directly from stone to iron, but that was due to the fact that this metal was introduced while they were still in the Stone age.

Though the Danish archeologists devoted so much time to the discussion of this question, they were still able to consider other questions. Side by side with this discussion there was another about the division of the Stone age, and this has been no less important to Danish archeology. The European Stone age is, as is well known, divided into the *Paleolithic* age, the age of the caves and river-gravel, an age in which nothing was known of *polishing* stone, and the *Neolithic* age, "*l'âge de la pierre polie*," as the French have unhappily called it. In the Paleolithic age Denmark can hardly have been inhabited. This was the time of the glaciers, in which the country assumed its present shape. It is just possible that it may have been visited by man in interglacial periods, but of that we have no proof. The whole Scandinavian Stone age is Neolithic, but in the early stages of it the polishing of flints was unknown. It is just this point that has been discussed for so many years. It was found at the very beginning of the search in the kitchen-middens of the sea-coast settlements in the early fifties, that in many of these there were neither polished flint articles nor any of the beautiful and delicately-made prehistoric objects which were so well known, having been found in large quantities in the surface soil and in the large dolmens. From this, and from several other things,

Worsaae concluded that the oldest kitchen-middens dated from an earlier period, in which the polishing of flints was unknown; whilst Steenstrup insisted that they represented only one special side of the life and culture of the Stone age, and that in reality they were contemporary with, and were made by, the same people that had erected the large dolmens, with their beautifully polished and finely carved stonework. Both views had supporters, and the strife continued—or, rather, flared up from time to time—till quite lately. It has ended, presumably, with the death of Steenstrup, and ended in the triumph of Worsaae's opinion. Many and detailed have been the investigations it has given rise to, but it has always been possible for those in favor of the division to refute their opponents' arguments. There was one particular implement found in the kitchen-middens around which, after a time, all the strife centered. This was the so-called triangular axe. Steenstrup's followers would not acknowledge these axes to be edged tools, much less axes, and then was asked, and rightly, "But where are the edged tools of that time? There must have been some, and until you can show them to us we must withhold recognition of your division." Well, after a time axes were discovered with marks of use upon them, and these always on that side which Worsaae rightly called their "edge," and one single specimen of them was found with the remains of a wooden handle attached to the side opposite to the edge, and finally it was practically demonstrated that they could very well be used to cut wood. This ended the discussion.

In 1886 I was fortunate enough to discover a very large kitchen-midden, hitherto unknown, situated by the little village of Ertebølle, in Himmerland, by the Limfjord. I explored it by myself at first, and afterward directed the attention of the archeologists to it. A commission of archeologists, geologists, botanists, zoologists, etc., was formed and sent to the place, where they have worked for several years, and examined a part of this, the largest kitchen-midden found in Denmark. When the results of the investigations so far concluded are published, it is to be hoped that the last doubts on the subject will have been disposed of, and that it will be proved that Denmark was inhabited before the art of polishing flint was known. Our archeologists will then have the task of locating this

period either in the Paleolithic or the Neolithic Stone age. It will most likely be shown to belong to a purely Scandinavian development, and it will probably also be proved that neither in England, France, nor elsewhere was the art of polishing stone known at the beginning of the Neolithic age, and that therefore the name "*l'âge de la pierre polie*" is most unsuitable.

Undoubtedly there was a time, extending over several centuries and lying between the old Scandinavian Stone age and that age in which cairns and dolmens were erected, in which there was an immigration of peoples, who brought with them polished implements of a Western European type; or a current of civilization must have proceeded from Western Europe and brought these implements to the country. For we find, especially in Denmark, very many pointed and sharp-edged axes of flint, many spearheads, etc., which are exactly like the English and French, but which are never or, at least, very seldom, found in our tombs.

We have here a period of which no burial places have been found (as is the case with the time of the kitchen-middens), but this period will be of vast importance to the correct understanding of our prehistoric times, as it forms in the first place one of the connecting links between Western Europe and Scandinavia, and in the second place the foundation for the great and peculiar development which the Stone age reached in Denmark.

Sophus Müller has succeeded in producing a reliable chronology of the Stone age — a space of time covering centuries, or even so much as a thousand years, must be capable of division. We must be able to distinguish between the ancient and the more modern, even in those times. The basis for such division must be sought, on the one hand, in the shapes of the graves, on the other hand in the different types of ancient implements; both have received the attention of Müller. As regards the graves, they start with the small square-chamber type, made of four stones with one flat stone on top. They gradually develop into the large "passage graves," consisting of roomy, in most cases oblong, chambers with entrance by a roofed and paved passage, which varies in length. Later these changed to stone cists, which gradually decrease in size, so that at the end of the Stone age we find them just large enough to contain the body in a recumbent position.

It was not wholly unknown that there was a group of graves in Jutland which differed greatly in character from the usual type of grave of the Stone age — the dolmen. They have been called "framed graves," because, as generally found, they consist of an oblong rectangular chamber framed by a single line of smaller stones. Very often the larger portion of this stone frame is missing, often the whole has disappeared, so that the grave can be traced only by the different color of the soil inside and outside of the grave chamber. These burial places are situated generally in the earth, not on the surface, and are sometimes covered by a tumulus. In the eighties, while working at the archeological discoveries in the Rinds and Gislum townships I called attention to the presence of such graves, whose chief distinguishing feature is that both the chamber and the coffin are missing, and that they are underground; but no research, either by myself or by others, was comprehensive enough to discover their real value.

When the Rigsdad voted an annual grant (a considerable one for Denmark) for a thorough archeological exploration of the country, and later on for the examination of the thousands of mounds scattered all over the country, most of which were already to a greater or less extent destroyed or disturbed, much light was cast on the subject by these investigations. Scores upon scores of these "framed graves" have been explored in southwest Jutland, whence they extend, though in more scattered numbers, north and east. Hundreds of them are marked by the round tumuli (generally quite small) covering them, and there must certainly be thousands which will be brought to light only by accident, because they are far below the surface, unmarked by a mound. It is likely that this kind of sepulture also was used outside of Jutland, at all events in Funen, where a certain kind of flint axe characteristic of the period is also found buried some feet deep. At any rate, the graves in Jutland form a large group by themselves, characterized not only by their arrangement, but by their contents, which consist almost exclusively of a certain late type of flint axes, of flint spear- and arrow-heads, also of a later date, and finally of battle-axes made of granite, sandstone, etc., generally extremely delicately made and bored through for the handle. Some of the finest things of this sort in existence

come from these "framed graves." We have from them relics of the latter part of the Stone age, which in a certain section of the country lasted so long that we can trace a definite development in it. But the origin of these articles must be sought for outside the country, toward the south and west. It is supposed that a tribe of people from those parts came to the country and wandered up the west coast of the Duchy of Schleswig, and of southern Jutland, or else that a regular trading road was formed there. Which of the two suppositions is right must be left to later discoveries to show.

In later years our previous ideas of the later Stone age of the North have been much broadened by research. Formerly it was thought that their culture was at a very low level, and that the people were hunters or fishermen without any knowledge of farming. It was known that it was not so in other countries, but it was long before any proof was found that even here in the North the people of the Stone age had domestic animals and tilled the ground. Without doubt, the people of the early Stone age lived solely on the proceeds of hunting and fishing, supplemented by the berries, fruits, and roots of the forest. But in the later Stone age, circumstances, even here in the North, had changed. Though we have not found a single bone belonging to a domesticated animal in those kitchen-middens in which are found no articles of polished flint, we find them in the middens of a somewhat later period. It has been shown that as early as that period marked by polished flint — animals of a Western European type — sheep and most likely oxen were kept; it is practically certain that in the time of the big stone sepulchers, of the "passage tombs," both goats and pigs were introduced, and most likely horses as well, so that even the people of the later Stone age knew and kept practically all the domestic mammals now known in Scandinavia. Dogs had been brought in by the first immigrants. In the cairns, and those kitchen-middens contemporary with them, are found bones of the domestic animals I have mentioned, and often also those of wild animals, sometimes shaped into implements.

But agriculture was also pursued in some degree, at all events toward the end of the Stone age. We come to this conclusion partly because we have found — sometimes even in the graves — the large stones, hollowed by friction, which were used here, as

everywhere else in the world, for grinding corn; partly because some of the corn, curiously enough, has been found preserved. Thus, a Jutland schoolmaster called attention to the fact that he had found some grains of wheat (now turned to coal), besides the impression of others, baked in the clay of which the vessels of the Bronze age were made. This gave the impetus to many investigations, by which it was shown that even in the clay vessels of the later Stone age these grains were found, though only of wheat; while in the vessels of the Bronze age grains of barley and millet seed were found as well, but no rye. Finally, in 1899, a most interesting discovery was made in a swamp, consisting of a sickle with a blade of flint and a handle of wood. This may well have been intended and used for harvesting grain. At any rate wheat must have been grown at the end of the later Stone age. As yet we do not know how far back the art of agriculture dates, perhaps it was even known at the beginning of this period, but certainly not in the earlier Stone age. Many things lead us to suppose that millet also was grown in the Stone age, although as yet we have no proof.

We must therefore correct our ideas about the Scandinavian people of the later Stone age. They were not savages who obtained from Nature a precarious existence by means of fishing and hunting. They were a comparatively civilized people who tilled the ground and bred many domestic animals, although they fished and hunted as well. They were undeniably expert in many arts (the making of clay vessels, stone carving, wood carving, etc.); they produced wonderfully well-made weapons and tools, and in great variety; the division of labor was fairly even; they had fixed residences, commercial intercourse, a religion whose standard was not low; their sense of beauty was great, as is shown by their ornamentation and the beautiful shapes of their weapons, which are sometimes almost refined in form. In short, they had attained a definite stage of civilization.

Thus we see that, in the last decades, much has been done by Danish archeologists to determine the conditions of our Scandinavian Stone age. And the same has in no less degree been done for the Bronze age. All investigators were obliged to occupy themselves

for some time solely with this period, and that has, of course, borne fruit.

One question that has been raised is still unanswered. It is this : Was the passage from the Stone age to the Bronze age in Scandinavia due to the immigration of a new race of people or to the regular currents of civilization without any immigration? The scarcity of objects that could be attributed to a transition stage point to the first solution, but the regular continuation into the early Bronze age of the method of burial peculiar to the later Stone age (stone cists with one recumbent corpse, not cremated) points to the second, or, at least, indicates that the immigrants were very similar to the original inhabitants in manners and customs. But it is quite clear that throughout the whole of the Bronze age there was commercial intercourse with southern countries, at first with the lands around the eastern Danube and Hungary, later with Italy. In this way much bronze and gold was brought to Scandinavia, most likely in the form of weapons, ornaments, and tools, which were, of course, melted down after a time to be remade according to the taste of the period. Comparatively few of the foreign-made articles have survived; among them are some originating in England and France, with which countries, there must, therefore, have been communication. The means of exchange in Denmark in all probability was, first and foremost, amber, which, though found in such imposing quantities among our relics of the Stone age, seems to have quite disappeared in the Bronze age — it was, of course, exported.

The Bronze age in Scandinavia extended over a long period; indeed, it is strange how long it took for iron to make its way. As a result, the Bronze age reached a higher state of development in Denmark than anywhere else on the face of the earth. This is what gives to this period its extraordinary scientific importance. For eight or ten centuries bronze and gold were the only metals known in Scandinavia. Such a long period must be divided into shorter periods, and it must be ascertained what belongs to an earlier or a later period, what is beginning and what is end. Here also a great work has been performed. In 1859 Worsaae divided the period into an earlier and a later Bronze age, having as early as 1843 come to the conclusion that those bronze articles which were decorated in spirals were the oldest.

It may be thought that such a common, simple, and elementary decoration as the spiral was rather a slender basis for such an important decision. Yet it is not found in our Stone age; it appears very often in the Bronze age, and can be traced through the east of Central Europe to the countries around the eastern Danube; to Mycenæ and Egypt; and it is a proof of Worsaae's penetration that he so quickly became aware of its importance. After a time there was seen to be a sharp division between two groups of bronze articles, an earlier and a later, and the division between the periods to which they belong is almost contemporary with a great alteration in the burial customs: the transition from the burial of unburnt corpses to cremation.

Throughout the Bronze age there is a clearly traceable development in the shapes of the graves. On the whole, those are the oldest which contain unburnt corpses, in stone cists or under heaps of stones covered by mounds, which are often of great size.

Contemporary with these are the famous graves with oak coffins, which have given us such priceless information about the manners and customs of the earlier Bronze age; about the costumes of men and women; about the way in which weapons and ornaments were worn, etc. We know, by this means, that the men did not wear beards; and by a minute microscopical inspection of the well-preserved locks of hair, it has been demonstrated that the race was fair.

Occasionally we find, in graves of the same shape and size, burnt bones, which point to a new way of treating corpses, namely, by cremation; and this finding almost marks the boundary-line between the early and later Bronze age. But a few burnt bones do not require a large grave, and so, gradually, the graves diminish in size, as do also their accompaniments. Very soon the custom arose of burying the carefully collected bones in a clay urn specially designed for the purpose, which also contains the small objects of bronze or bone which are buried with the corpse. These urns, surrounded by stones, are placed either in the old mound or in a new and smaller one on the top of it; they are also found singly in fields, or in larger quantities in a graveyard.

Outside of the graves have been found many unused articles, both weapons and household implements belonging to the Bronze

and the Stone ages, which we presume must be hidden treasure or commercial stock ; some of them must also have been votive offerings and some intended as gifts, hid during the lifetime of the person in hope that they might be of use to him or her in the hereafter. In such ways the value of the grave-goods, so poor in the later Bronze age, is enhanced. The votive offering often consists of weapons, such as seven axes, thirteen spearheads, etc., which we must presume were buried in fulfilment of a promise to the gods, as a thankoffering for preservation in danger or illness, etc. It is a curious fact that this group of finds always, or almost always, presents objects of one kind, to wit : all spear-heads or axes, knives, etc., but rarely a mixture of different kinds of objects, as spears, axes, knives, etc.

Sophus Müller has proposed to divide each of the two divisions of the Bronze age into two, based on the differences in the decorative work ; but the typical differences will necessarily be less well defined, and the transition stages more vague, the shorter the periods into which the time is divided.

Among the detailed investigations pertaining to the Bronze age must be mentioned those to which the well-known "lurer," or war trumpets, have given rise. In the peat-bogs of Denmark and southern Sweden many large and beautiful trumpets have been found, a yard and more in length, and made of bronze. They are very thin, and made in several pieces, afterward fastened together ; they are richly ornamented, and often have chains and small pieces of brass attached. They are always found in pairs, which are seen to belong together owing to the bend in one of the pair being always in the opposite direction to that in the other ; in one case no fewer than three pairs were found together. Much was spoken and written about these instruments, but to little effect until the composer, Hammerich, examined them to find their musical powers and value. The six that were in the best state of preservation were restored, only very slight repairs being needed, and it was found that they were in excellent working order and really perfect.

Many carefully calculated peculiarities of shape and work contributed to give them a mildness and softness of tone, which was, nevertheless, powerful. Each pair is carefully tuned together, the

notes being C, D, E \flat , E, and G. The instrument was held upward when played; in this position it is well-balanced, and the sound is carried to the audience. The notes are the so-called "natural notes," which are produced only by the lips. The register contains 12 notes in $3\frac{1}{2}$ octaves; if the harmonic notes in the bass are included, it is increased to 22, but we, of course, do not know whether all were known in prehistoric times. The tone of the instrument is very much the same as that of a bassoon; as they are found in pairs tuned together, there is reason for supposing that they were used together. This is, quite briefly, the chief result of Hammerich's investigations; it is surprising that, at so early a period, we in Scandinavia had such highly developed musical instruments. But it agrees very well with our present knowledge of the Bronze age and its people. We knew that the people of the later Stone age had a comparatively high state of culture; we can, therefore, hardly call it surprising that we have found that the Bronze age was still farther advanced. It is an obvious result of the investigations of modern times that we have realized that the Scandinavian Bronze age was a period of extraordinary development, a period hitherto undervalued. The people bred cattle and were agriculturists. We have already mentioned the domestic animals and kinds of grain known to them. They had fixed dwelling-places, and cleared large expanses of forest. It is shown by the fact that the large groups of tumuli found all over the country are so often gathered around the sites of modern villages, that many of the latter were actually founded in the Bronze age. Long rows of these tumuli are also found stretching for miles across the heaths of Jutland, where they are in the best state of preservation. They often either begin or end at ancient fords, and there is no doubt that they ran by the side of old paths or roads. These, of course, followed the habitations, so that we can trace the course of the builders by means of these tumuli.

It is easy to show that the people of the Bronze age were commercial and seafaring men. The steady influx of metal must be due to commerce. It was paid for in amber, and perhaps also in hides and grain, and such things. Shipbuilding was fairly well developed; canoes hewn out of oak logs were no longer sufficient. On many bronze implements, especially razors, and on a certain kind of large

neckrings, we find engraved seascapes, showing us large vessels with a keel and a prow rising high from the bow which makes the vessel look as if it had a double prow. We find these ships again in the figures of the so-called *helleristninger* (rock-carvings), carved or scratched on large isolated stones in Denmark, and far oftener on the faces of cliffs in Bornholm, Sweden, and in southern Norway (fig. 110). But so far we had found no boat preserved from that remote time. Great therefore was the rejoicing when a few years ago a large num-



FIG. 110. — *Helleristninger*, or Rock-carvings. (Scale about $\frac{1}{12}$.)

ber of small models of the boats or ships of the Bronze age were discovered. Buried in a clay vessel were found more than one hundred small boats a few inches in length, made of thin gold sheets, beaten out with the help of bronze tools (fig. 111). It was clearly shown that they had, in the Bronze age, good seagoing vessels, built of laths fastened together with wooden pegs. The hoard must be considered as belonging to the aforementioned class of votive offerings. The gold boats must have been given or sacrificed to the gods as a thankoffering for success in battle, or a danger surmounted, or some such thing; either all at once or at different times. Perhaps here was the shrine of a god of the sea.

Industry had also reached an advanced stage. The art of working in bronze was highly developed ; even now we cannot mold so finely or thinly as they did. The "lurer" and many of the bronze vessels must arouse the admiration of all who know anything about metalwork. Soldering was unknown ; if an article of bronze was injured, they tried to repair it with melted bronze, or by putting on a thin plate. The rich ornamentation is executed with finished skill. We learn from various facts upon which we cannot here enter in detail that this industry was highly developed. For example, the textile fabrics found in the oaken coffins are beautifully woven, and to-



FIG. III. — Gold Vessels of the Bronze Age, including some of the Tiny Gold Votive Boats. (Scale : Gold cups, $\frac{1}{8}$ to $\frac{1}{6}$; vessel with handle, $\frac{1}{8}$; gold boats, $\frac{1}{8}$.)

gether with them are found finely knotted hair-nets, and caps with an outer layer of some tufted stuff ; it has been found impossible, hitherto, to discover how they were made.

Our knowledge of the time is, of course, fragmentary, and will always remain so ; we know little of the undoubtedly highly developed craft of woodcarving ; still less of the arrangements of their

dwelling, etc., but we have discovered enough, especially during the last decades, to make us respect the people of the Bronze age. Their weapons, ornaments, and tools, the shape and ornamentation of which are highly artistic, say much for their sense of beauty. The votive offerings, the grave-goods, show that they had a religion; a belief in gods and in a life after death; it is most probable that they had a more or less developed mythology, and many tales. The "lurer" testify to their being musical, and among a people who had cultivated and understood music so well the poetic muse cannot have been wanting. Writing was unknown, but the rock-carvings must be considered as a sort of pictorial writing, by which the memory of great men and great deeds was preserved to posterity.

The result, then, of Scandinavian research into the Bronze age is this: We now have a thorough outlook over the time, over its culture, the process of development, etc.; and, above all, we can with justice maintain that hardly anywhere else on earth has the culture of the Bronze age reached so high, so rich, and so peculiar a development as here in the North.

We have trespassed for so long on the time and patience of the reader, that we must be brief in our account of the Iron age, though there is much in it that is new and interesting.

Many years ago Worsaae showed that the Iron age could also be divided into, at least, "the earlier" and "the later." But subsequent investigations have shown that, at all events in Denmark, there are more and well-marked divisions:

1. The Pre-Roman, or so-called "Celtic" period.
2. The Roman Iron Age.
3. The Age of the migrations.
4. The Post-Roman Age.
5. The Age of the Vikings.

It is presumed that the Bronze age superseded the Stone age about 1,200 years before the commencement of our present era. Iron superseded bronze about 800 years later, so that we now place the commencement of the Iron age at about 400 B.C. We have found, very rarely, a small ring, a pin, or a knife of iron from the latter part of the Bronze age; but such finds are merely forerunners. The appearance of iron implements in any great number

coincides with the introduction of an entirely new style and shape of antiquities. The question as to whether this was owing to the immigration of a people to whom the use of iron was known, or to the importation of a new civilization, is still unsolved.

The whole character of the oldest iron articles, as well as those of bronze and gold of the same period, and the clay vessels contemporary with them, are of the so-called "Celtic" pattern, though with certain modifications that show that the imported patterns were altered (at least to some extent) to suit Scandinavian tastes.

The Celts, whose last descendants have been driven to the western extremities of Europe—to Ireland, Scotland, Wales, and Brittany—lived, in the last centuries before Christ, in central Europe, whence their influence reached Scandinavia, and was strong enough to end the Bronze age. The Iron age does not betoken a revolution in Scandinavian civilization. The change consists in the gradual superseding of bronze by iron in weapons, implements, and ornaments, and a consequent change of taste. People continued to use bronze, but "zinc bronze" (brass) instead of "tin bronze." The burial customs remained unchanged, at all events at first, and cremation continued to be the rule; our burial and "fire spots" (bones and coal from the pyre buried in a hole) continue through the earlier as well as the later age; but it became more usual for the graves to be gathered in one large space, either under a very low mound or with none at all.

The very earliest stage of our Iron age became known to science only by the explorations of Mr Vedel, a high government official in Bornholm, whose investigations are among the most admirable and thorough in the history of our archeology. Thousands of "fire spots" were excavated, together with small low mounds built of stones (*röser*) belonging partly to the later Bronze, partly to the Iron age. From among these Vedel speedily separated some, in which were found a very few and badly preserved antiquities differing from all others previously known. Similar ones have since been found in other places, particularly in Jutland, while the great Danish isles seem only to have been slightly affected by this advance of culture; the Bronze age seems to have continued there a century or two longer than in other parts of Denmark.

Those modifications in style which are also found in northern and central Germany at a corresponding period are soon lost ; a home style is adopted, founded, however, on the imported one.

The "Celtic" Iron age in Denmark is still far from being so well known to us that we can see and comprehend it at a glance ; we shall, therefore, not dwell long on it, but merely mention the chief discovery : the wonderful carts from Dejbjerg Mose in western Jutland. A few "rock-carvings," and a single small cart of bronze, on which a large bronze vessel was placed (for use in a temple or at the festal board of a chief), showed that carts were not unknown in the Bronze age. But no one thought that immediately after its close the people of the Scandinavian North were in possession of a conveyance so technically perfect, comparatively speaking, as the "Dejbjerg" carts, one of which, in a restored condition, is exhibited in the National Museum in Copenhagen, and is considered among that museum's chief treasures. These carts had four wheels, with nave and rim of ash. The latter was in one piece, which was bent round while in a state of heat, and covered with a heated tire. The sides, the shafts, etc., are of ash, richly ornamented with bronze, the ornamentation being of a foreign pattern, consisting also, in part, of human faces made of bronze. In the midst of the cart is a square stool, in which the chief, or, may be, the idol, for whose use it was intended, had his seat. They were arranged for two horses, which were harnessed by means of a yoke. Without doubt the workmanship (which is splendid) is Scandinavian, though the style is the so-called "Celtic."

Gradually, as the power and might of Rome increased, Celtic culture and the Celtic race had to bow before her, and soon we can trace the influence of Rome in the North, whither, however, as is well known, her political power never extended. The Celtic age was superseded, about the time of the birth of Christ, by a Roman, or rather an age whose style was strongly influenced by Roman culture, and in which Roman manufactures were largely imported. At the time when the Germanic tribes crossed the borders of the Roman Empire, classical imports and influence still continued, but the age was characterized here in the North by the influence of Germanic style, and therefore the time of the migrations in the third, fourth, and fifth centuries forms a special period by itself.

Within the last few years we have made two discoveries concerning this period: one in Jutland relating to the older Roman period, and one in Zealand relating to the time of the migrations, both characterized by their graves. In Jutland we have a group of graves from the Roman time, the so-called "urn-graves," to which, among others, I called attention in the eighties. We find in mounds, or buried in level ground, large cists made of slabs of stone, sometimes covered with one or several big stones, but generally open. At first glance they resemble the dolmens of the later Stone age, but



FIG. 112.—Clay Vessels from Jutland Graves.

there are peculiarities in their building which make it easy for us to distinguish them from these, even without reference to the burial accompaniments. The bodies are generally unburnt; they evidently belong to a period when cremation was giving way to burial; but the bones are generally decayed, because, as stated, most of the graves have not had any stone or slab cover, and are filled with earth. Generally there is only one body in each cist, and there are very few antiquities—nothing but a pin or ring of iron, or a knife of the same metal. But, by way of compensation, the departing one was given a whole set, as a rule, of beautifully finished clay

vessels, small and large, many of which are still unbroken — evidently a selection of household vessels, filled with meat and drink for the use of the deceased on his way to the other world (fig. 112). I have found as many as from twelve to fourteen unbroken vessels in one grave. There are often also heaps of broken ones, placed either in the coffin or buried quite close to it. There are great quantities of them: very often sherds of a score or more vessels, and yet the pieces never make up one single whole vessel. There seems to be no other explanation of this than that all the vessels, used at the funeral feast must have been destroyed, and some of the pieces gathered and buried with the departed, as a sort of memento of the great feast. In my collection I have a great many pots from these “urn-graves,” mostly of delicate shapes borrowed from Roman metal urns, and beautifully ornamented. Similar urns are found in great quantities in the large burial places of the same date in Funen, where, however, cremation was still the rule.

The other group of graves is the so-called “skeleton graves” from the islands, especially Zealand. When digging in level ground skeletons are often turned up, buried from three to four feet down, generally several close together, but the groups are always very small. Very often there are no antiquities with them, but sometimes these small burial places have yielded an astonishing number of these, partly of Roman, partly of Germanic origin. Rich finds have been made, especially at Nordrup, near Ringsted, and Vallöby. There are gold and silver objects, especially rings and wonderful buckles; bronze vessels; beads of glass and mosaic, but, above all, some especially beautiful and unique glass vessels, which make the “skeleton graves” famous and are peculiar to them. The name shows, of course, that the bodies were unburnt. The glass vessels are, in some cases, ornamented with artistically executed raised figures in colored glass, representing men and animals in the arena. Gladiators, bulls, lions, and tigers are seen in bold relief; the movements depicted are true to nature, and, strange to say, the vessels, though the workmanship is undoubtedly Italian, have rarely been found outside of Denmark.

From the time of the migration also date all the discoveries in the bogs — the Nydam and Thorsbjerg finds and others. . They all

point to great battles, either intertribal or against invading tribes, whose manners and customs must, however, have been similar to those of the natives. It was supposed that the victors collected the spoils of war and sunk them in holy lakes or at the heads of the fjords as an offering to the gods.

But since Sophus Müller's latest investigations a different conclusion has been reached. The things cannot have been sunk in water, as is shown by the condition of the surrounding peat and of the articles of wood. They must have been left lying on the field of battle, an open spot in the forest (a forest since become a marsh), or have been collected in a heap on the ground in the vicinity. After a time the bog has covered them; probably the local stream and surroundings have changed in course of time, so that the growth of the peat has been more rapid. It is not certain that this explanation holds for all cases, but it does for some. But the character of the discoveries is not changed. It is still possible that they are articles given to the gods as a thank-offering for victory.



FIG. 113. — One of the Gold Horns from Schleswig, with Runes. "Ek Hlewagaster Holt-ingar Horna Tawiðo" (I, Hlewagaster of Holt, made [?] the Horn). (Scale, about $\frac{1}{8}$.)

The most wonderful antiquities that have ever been found in the Scandinavian North are the famous Schleswig gold horns which, unhappily, were stolen and melted down at the beginning of the last century. Heavily have all of us who take an interest in the early history of our country felt this loss; so much the more as the pictorial representations that so richly adorned them were unique, and there existed not even a rubbing of these.

There was, therefore, great joy when, a few years ago, it was announced that an article in the style of the gold horns had been found, just as rare and peculiar as these, though of a baser metal of less value (fig. 113).

The big silver vessel, now already world-renowned, from Gundestrup marsh in Jutland (fig. 114), was a unique, and, to science, an invaluable discovery. It was found in pieces in a peat-marsh; the silver plates, of which the upper part consisted, were laid in the bottom of the vessel. It is richly decorated, partly with large, bold figures of men, gods, animals, etc., some of which make up pictures of processions, sacrifices, and hunting scenes. The lower part thus represents an ancient urus hunt, while the outer plates of the sides



FIG. 114. — Silver Bowl found in Gundestrup Marsh. (Diameter $26\frac{1}{2}$ cm.)

each represent a large head of a god or goddess, and the inside ones are covered with pictures, some of which are difficult for us to understand. Unquestionably the vessel dates from the time of the migrations; the figures are partly of classical origin, but barbarized; doubtless the influence was Gaelic. The evidence points to the fact that Gaul was the place from which were drawn the chief features in the style, etc., if it be assumed that it was made here in the North. Nothing further can be said about it at present, though of course conjectures, more or less fantastic, have not been wanting; among these, that of Professor Steenstrup, who endeavors to trace

its origin to the Buddhist regions of central Asia, is the most fantastic and improbable.

At the time of the migrations an ornamentation, founded on imported pictorial representations, and consisting of figures of animals, began to develop in Scandinavia. This continued and was further developed in the subsequent period, "the post-Roman," which is marked by the gradual rise of a style peculiarly Scandinavian, which continued to hold sway till well into the Middle Ages. Sophus Müller and Professor Wimmer especially have within the last few years produced important works concerning the post-Roman and Viking periods. The former has written the history of animal ornamentation, and shown how it arose and developed in Scandinavia, how in time new impulses were brought to it from England and Ireland, from Carlovingian France, and even from Byzantium; how these importations influenced it, how it adopted them and changed them according to requirements, and how from time to time it stiffened and sterilized, only to reawaken into new life and power.

Wimmer, on the contrary, devoted himself to the task of deciphering Runic stones and Runic epitaphs, a field in which his work has been of great importance. However, very little of moment has been discovered about the last period of prehistoric times, that is to say, the Viking period, or the time just preceding it, at least in Denmark. We are poor in relics from that time in comparison with Norway and Sweden; Bornholm alone has yielded anything of importance in this direction. Recently, however, parts of Denmark, and especially Jutland, are contributing evidence; here one thing, there another. One special discovery has been made, namely, a few graves from this period which were hitherto lacking. Christianity was introduced earlier into Denmark than into the rest of Scandinavia; up to a certain point this would explain the scarcity of relics and antiquities from the close of these times, but it was, and is, a riddle, what has become of the riches which the Viking expeditions brought to Denmark, and where the graves of that period are. Would that time and patience might solve this, as they do so many other riddles.

Here I will close. Dare I hope that the reader has received the impression that we in Denmark, as throughout the Scandinavian

North, have labored hard and ceaselessly to shed light upon our early history? Our Parliament has liberally voted money for surveys, investigations, and excavations throughout the country, and for the preservation of relics discovered; also for purchases to enrich the collections in the National Museum at Copenhagen and in provincial museums, as well as for the acquisition of many large and important private collections.

The inhabitants all over the country have, on the whole, assumed an attitude favorable to archeological research. Permission to excavate mounds, graves, kitchen-middens, etc., has generally been willingly accorded. A great proportion of the non-excavated mounds, numbering altogether more than two thousand, has been *given* to the State, sometimes even by poor cottagers. The larger collections have been endowed with many valuable finds made by private people, and many extraordinary objects have been saved from destruction by the sensible and careful proceedings of laymen. It is becoming more and more the general practice when, in digging, articles of value are brought to light, to stop work until scientific assistance is forthcoming in order to secure the proper superintendence of the operations.

Throughout the country are now scattered many public collections, and a very large number of private collectors have assisted in saving much that would otherwise have been lost. Public and private collectors have in general worked well together, and it is seldom that the National Museum does not obtain whatever it wants.

Last, but not least, our archeologists have, as I have striven to show, worked hard and presistently, following in the footsteps of their great forerunners, Thomsen and Worsaae. To them, before all, we owe the fact that the prehistoric times of Denmark are uncovered to us and more clearly illumined than, I suppose, is the case in any other country. It is to them we who love our country and its memories owe an inestimable debt of gratitude.

Since the writing of this brief essay Danish archeologists have by continued explorations brought to light different facts which would indicate that Denmark was — even if sparsely — inhabited at a time preceding the “Kitchen midden period,” namely, during the

so-called "Ancylyus epoch" when the Baltic was still a lake having its outlet through rivers situated where the belts and sounds now are. A large find in a bog near Mullerup, in the western part of Zealand, not far from the Big Belt, seems to indicate that those people whose remains we find in this dwelling-place were living on timber rafts in the lake which at the time covered the ground now taken up by the bog; also, that they made less use of flint and other stones for weapons and instruments than of wood, bone, and horn. The great number of elks' bones and horns found seems to indicate that the find is *older* than the oldest shell-heaps, and from the kinds of wood found it appears that *pine* was the prevalent forest tree. There were discovered at the same place a series of types of bone harpoons, horn axes, and similar objects, which up to that time were known only as individual finds in peat-bogs, at the bottom of lakes, and in similar places, and which, consequently, now prove to belong to a period of the Paleolithic age that has, so far, been overlooked.

Of reindeer no trace was found in the Mullerup marsh, and we have as yet no proof that man had come to Denmark and the rest of the Scandinavian North during the first post-glacial, arctic epoch; but it would hardly surprise any Scandinavian archeologist if continued explorations should prove man here also to have been the contemporary of the reindeer.